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Short Communication

Epidemiological aspects of schistosomiasis in workers of the Movement of Landless Rural Workers

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ABSTRACT

Introduction: Schistosomiasis is endemic in 74 countries and is considered a serious public health problem in some locations. **Methods:** A transverse study was performed of 13 landless settlements in southern Sergipe from February to December 2009. The study included 822 settlers, of whom 601 underwent stool testing. **Results:** The prevalence of schistosomiasis in landless workers was 4.3%. The population has a low education level, and basic sanitation services are not available to all residents. **Conclusions:** The prevalence of schistosomiasis was low in the population and among different settlements, possibly because of different forms of water use by the settlers.

Keywords: Schistosomiasis. Intestinal parasites. Settlements.

Schistosomiasis is caused by *Schistosoma mansoni* infection and is registered in 74 countries. Schistosomiasis is considered a serious public health problem in many areas of Brazil. Government actions are required to improve sanitation, control snails with molluscicides, treat infected persons, and educate at-risk populations[1].

Schistosomiasis is a disease with global impact that remains difficult to control centuries after its discovery because it involves interactions between government agencies, the planning and implementation of sanitation, the use of molluscicides to combat snails, drugs to treat infected people, and education regarding the deposition of feces[1].

The Brazilian social movement known as the Movement of Landless Rural Workers was created in the 1980s with the aim of promoting agrarian reform for landless peasants relying on unproductive properties. However, these settlements do not have an adequate health infrastructure, favoring the emergence of waterborne diseases[2].

To verify the presence of *Schistosoma mansoni* in the stools of landless settlers in riverside towns of southern Sergipe, Brazil, to evaluate the effect of socio-environmental factors on the spread of this parasite, and to characterize the clinical forms of the infected patients, we developed a cross-sectional study of 13 settlements within the region from February to December 2009 (**Figure 1**).

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The study population included those aged 2 to 65 years and encompassed 227 households from 13 settlements. The clinical epidemiological survey was conducted *in situ* through home visits. For the study of *Schistosoma mansoni* eggs, the first 3 stool samples collected on alternate days were packed in a TF-Test® Kit (Three Fecal Test; Imunoassay Ltd, Brazil). This set comprises three tubes, and the fecal samples were preserved under analytical conditions for 30 days[3]. The samples were sent for analysis at the laboratory of the University Hospital of the Federal University of Sergipe. All infected patients were treated.

From the 601 examinations, a prevalence rate of 4.3% was obtained for *S. mansoni*. Of the 13 settlements, 8 (61.5%) were positive for *S. mansoni*, and the positivity rate varied from 0 to 22.2% among settlements.

Among infected individuals aged 3 to 48 years, 69.2% were male subjects, and there were no differences in prevalence between adults and children younger than 14 years. All individuals with *S. mansoni* in the feces showed the intestinal form of the disease. The most common clinical manifestations were abdominal pain (84.6%), headache (65.4%), anorexia (42.3%), cough (34.6%), and nausea (30.8%). Abdominal pain was the only symptom with a statistically significant association with infection ($p < 0.01$). Among the settlers, 54.6% worked in agriculture, 71.7% bathed in the river, and 48.8% attended school. Furthermore, 69.3% attended elementary school, 26.9% were illiterate, and 3.8% had incomplete secondary education (**Table 1**).

The incidence of other parasites was also examined in this study: *Ascaris lumbricoides, Necator americanus, Entamoeba histolytica,* and *Giardia intestinalis* were identified in 13 settlements, *Trichuris trichiura* in 11, *Strongyloides stercoralis* in 7, *Enterobius vermicularis* in 2, and *Taenia solium, Taenia saginata, and Hymenolepis nana* in 1.

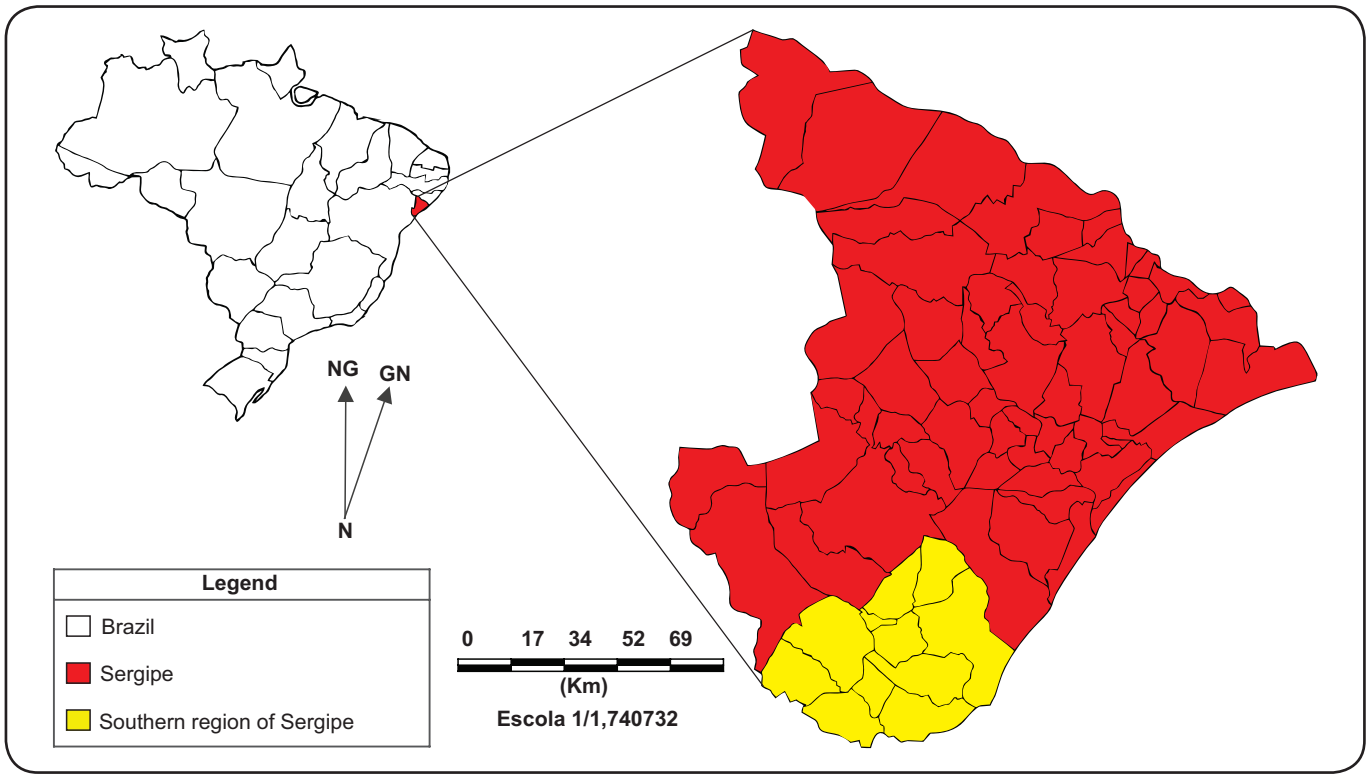

FIGURE 1 - Study Area in the State of Sergipe. GN: geographic north; NG: northern grid; N: north.

TABLE 1 - Distribution of sociodemographic variables of the Landless Settlers in the southern region of the State of Sergipe, Brazil, 2009.

	Schistosoma mansoni					
	total		yes		no	
Variable	n	%	n	%	n	%
Gender						
male	302	50.2	18	6.0	284	94.0
female	299	49.8	8	2.7	291	97.3
Attend school						
yes	293	48.8	16	5.5	277	94.5
no	308	51.2	10	3.2	298	96.8
Work in agriculture						
yes	328	54.6	12	3.7	316	96.3
no	273	45.4	14	5.1	259	94.9
Bathe in the river						
yes	431	71.7	17	3.9	414	96.1
no	170	28.3	9	5.3	161	94.7

Regions with a prevalence rate higher than 10% are considered of medium to high endemic prevalence, and those with a prevalence rate of less than 10% are considered of low endemicity. Most of the infected individuals presented the clinical intestinal form or were asymptomatic or oligosymptomatic[4,5]. In this study, the prevalence rate was 4.3%, characterizing the population as low endemicity. However, this does not minimize the importance of the data because positive individuals contaminate water reservoirs due to a lack of local health infrastructure.

The infection prevalence was similar among adults and children, in contrast to other studies that have shown a higher prevalence and intensity of infection among children in endemic

areas[6]. Male subjects were more frequently affected, although previous studies have indicated an equivalent prevalence for both sexes and that the severity of infection depends on the frequency of contact with contaminated water[7].

Sociodemographic analysis revealed a high frequency of bathing in the river. Among the individuals participating in this activity, 3.9% had *S. mansoni* in the feces, which represents a high risk of contamination of water sources[6].

Agricultural labor and environmental conditions are additional risk factors for the transmission of schistosomiasis; the irrigation system attracts snails, and cercariae can travel to the plantations. In addition, the washing of vegetables and fruits in the river may constitute continuous exposure[8].

The prevalence of infection ranged from 0 to 22.2% among settlements, even when located in the same county. This diversity was due to the focal epidemiology and dispersion of populations with high rates of infection in children[9].

In the settlement Bela Vista, 22.2% of the subjects were infected. Of these, 58.3% were children, possibly due to their longer contact with contaminated water during bathing in rivers and leisure[6].

No positive schistosomiasis cases were found in the settlements Paulo Freire II, Rosa Luxemburg, April 17, and Roseli Nunes, all near the town of Estancia. The focal character of the disease may have contributed to these data[9,10].

The present study did not quantify the parasite load. Some authors have defined high parasite load as essential for the development of severe forms of schistosomiasis. However, others argue that this is not the only factor because only a few develop hepatosplenic disease when living under the same epidemiological conditions in hyperendemic areas[7], while the intestinal form is more prevalent[11]. In isolated foci, schistosomiasis is characterized by an almost complete absence of severe forms, which are more commonly found in hyperendemic areas[7].

The control of schistosomiasis has been one of the most difficult undertakings of the Public Health Services. The importance of the disease is not restricted to its prevalence and geographic distribution but also incorporates issues of resistance of mollusks to molluscicides, precarious housing conditions, and basic sanitation and economic activities related to water use[12].

Although the region currently presents a low prevalence, it remains necessary for the managers of the Public Health Service to develop public policies to improve sanitation and to fully adopt the guidelines of the Unified Health System (*Sistema Único de Saúde*). This will prevent the spread of *S. mansoni* and subsequent conversion to a hyperendemic region.

It is likely that the low prevalence observed in this study is indicative of the absence of recent schistosomiasis transmission. Thus, we suggest that additional diagnostic methods, such as serological tests for the improved evaluation of long-term epidemiological control programs, should be utilized to confirm the data presented in this study. Immunological methods are more sensitive but are also more expensive and may cross-react with other helminth infections[5,13,14].

The prevalence of schistosomiasis among landless laborers in southern Sergipe is relatively low when compared to that of the entire state. Despite the low prevalence and mild clinical form of (intestinal) infection, the presence of *S. mansoni* infection in 61.5% of the settlements is worrisome because these migratory populations may carry the disease to other regions. The social and environmental conditions of the settlers, including primary education level, agriculture, recreational activities in rivers, and poor sanitation, were very similar in southern Sergipe.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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